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# HOW DURATION OF STAY AND PTSD IMPACT ENGAGEMENT WITH NATURAL BEAUTY IN A MOUNTAIN POPULATION

DIKSHA BIJLANI

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**How Duration of Stay and PTSD Impact Engagement with Natural  
Beauty in a Mountain Population**

By

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# Message from the Desk of Editor

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It gives me immense pleasure to welcome all to explore/publish/ comment in/on our journal, The International Journal of Indian Psychology (IJIP). There are a lot of challenges which the growing psychological face in the realms of basic necessities in life. Psychological thoughts can play a very distinct role in bringing about this change. One of the key objectives of research should be its usability and application. This journal attempts to document and spark a debate on the research focused on psychological research and ideas in context of emerging geographies. The sectors could range from psychological education and improvement, mental health, environmental issues and solution, health care and medicine and psychological related areas. The key focus would however be the emerging sectors and research which discusses application and usability in social or health context.

We intended to publish case reports, review articles, with main focus on original research articles. Over objective is to reach all the psychological practitioners, who have knowledge and interest but have no time to record the interesting cases, research activities and new innovative procedures which helps us in updating our knowledge and improving our treatment.

Finally, I would like to thank RED'SHINE International Publications, for this keepsake, and my editorial team, technical team, designing team, promoting team, indexing team, authors and well wishers, who are promoting this journal. With these words, I conclude and promise that the standards policies will be maintained. We hope that the research featured here sets up many new milestones. I look forward to make this endeavour very meaningful.

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## ABSTRACT

This study compares engagement with natural beauty in people who live in mountains and people who visit mountains occasionally. It also analyses the effect of Post Traumatic Stress Disorder due to floods on engagement with natural beauty, in the affected population (here, survivors of Uttarakhand floods). The constructs were measured using Engagement with Natural Beauty (ENB) scale (Diessner et al, 2008) and Screening Questionnaire for Disaster Mental Health (SQD) (Fujii et al, 2007). Findings reveal that 1) Mountain based people have a lower engagement with natural beauty than non-mountain based people, 2) Experiencing PTSD from floods lowers engagement with natural beauty in mountain based people. These findings implicate the need to incorporate mental health in disaster rehabilitation programs, failure of which shall lead to a disengagement of the resident population from their landscape. This may result in increased migration post natural disaster, and a decrease in environmental concern among survivors.

**Keywords:** *Engagement With Natural Beauty, Mountain Based, Non-Mountain Based, PTSD, Migration, Disaster Rehabilitation*

## **CHAPTER 1: INTRODUCTION**

There has been a general belief that excess of something that initially moved us will lead to a decrement in the value it holds for us over time. As such, there could be a hypothesised difference in the way people who reside in mountainous areas and people who visit mountainous areas only on occasion perceive and react to the natural beauty they witness.

### **Engagement with Natural Beauty**

Engagement with natural beauty refers to the connectedness one feels with elements of Nature. Often, this engagement manifests in different ways of responding to nature, that may range from spirituality to a strong sense of preservation.

Prior research has demonstrated the usefulness of understanding the human-and-nature relation. For instance, people more connected with nature reported greater environmentalism (e.g., “Environmental concerns outweigh all other concerns in my life”), ecological behaviors (e.g., “Turn off the lights when a room is vacant”) and dispositional perspective taking (Mayer and Frantz, 2004).

In one study (Gosling & Williams, 2010), farmers who felt connected to nature reported greater actions to protect the local vegetation (e.g., “Reduce stocking to encourage regeneration of plants”) and this effect was mediated by greater biospheric concerns (e.g., “Protecting native birds). Additional studies have shown that connectedness with nature differs across individuals and is a malleable construct. Schultz and Tabanico (2007) used the implicit association test on a mobile device and found that individuals that spent time in an animal park, a hiking trail or beach experienced increase in connectedness with nature.

However, there hasn’t been much probing on how this connectedness with nature changes as a function of the time of exposure to the natural beauty. This factor becomes relevant when studying environmental concerns in residents of a region as well as migration in village populations.

### **Uttarakhand floods and migration**

During 15–17 June 2013, exceptionally heavy rains occurred in Uttarakhand. The resulting flash floods killed about 4000 people and caused unprecedented damage to the roads (through slope destabilization), habitats, tourism and business industry, hydroelectric projects, and agriculture. During the disaster, more than 100,000 pilgrims were in the region, besides about 3 million local residents. Unofficial claims put the death toll at more than 10,000, damage to about 8000 km motor roads, and severe damage to 200 bridges. More than 5000 hill villages and thirty urban clusters of the hills were affected severely (Sati & Gahalaut, 2013).

Post the floods, newspaper reports (Upadhyay, 2014; Joshi, 2013) alarmed the government of increased migration from the villages as a result of damage incurred from the floods. However, a several survivors decided to stay back and revive residence in the land they had spent their lives in. The migration was fuelled by many factors, and this paper posits that one

of them was a disengagement with natural beauty as a result of post-traumatic stress disorder developed in the survivors after witnessing the calamity.

### **Natural Disaster and Mental Health**

During the past several years much interest among scientists has been in the relationship between natural disaster and mental health. Many researches have shown that there was a relationship between psychological problems and the disaster among different groups of people who were directly involved with the disaster such as the victims as well as those involved in rescuing them (Nasir, Zainah, & Khairudin, 2012).

It is essential to explore this relationship as an extension of how the affected population views their homeland post the occurrence of the disaster. If there is, indeed, a lower engagement with natural beauty in the residents of mountains compared to the occasional visitors, and if these residents, indeed, do get disengaged from the same natural beauty due to the trauma faced in the wake of a disaster unleashed by nature, then it will become extremely necessary to mitigate this trauma as part of disaster rehabilitation. This would call for more holistic disaster rehabilitation programmes which integrate concerns over material poverty with mental distress and help the survivors of these disasters with both these aspects.

## CHAPTER 2: METHOD

### *Objective*

The aim of this study was to compare the engagement with natural beauty in mountain based and non-mountain based people, and analyse how PTSD due to floods affects engagement with natural beauty in mountain-based people.

### *Hypotheses*

The study tested the following two hypotheses:

*Hypothesis 1:* Mountain based people have a lower engagement with natural beauty than non-mountain based people.

*Hypothesis 2:* Experiencing PTSD from floods lowers engagement with natural beauty in mountain based people.

### *Sample*

The sample consisted of 85 participants across India, with age ranging from 18 to 47 years and average age of the sample 23 years. Out of these, 40 were female and 45 were male. 44 respondents were non-mountain based and 41 were mountain-based. The non-mountain based respondents was a convenience sample widely distributed geographically; the mountain-based respondents was a sample comprising partly of survivors of the 2013 Uttarakhand floods from the Rudraprayag district and surrounding regions, which were affected maximally, and partly other mountain-based people.

The sample size, though limited, is sufficient to carry out the objective observations and statistical calculations between groups in the paper, with introspective study of individual differences. It must also be noted that the survivors of Uttarakhand floods who opted to stay back in the village as residents is few, and those among this population who would qualify to report on an English scale of PTSD is even fewer. But even with this limited availability of the target population, the study goes ahead to make an observation about the relation between engagement with natural beauty and PTSD, that shall extrapolate to similar post-disaster situations in the future, and hold significant implications for post-disaster policies.

### *Research Design*

This was an exploratory and confirmatory research. The sample was demarcated on clear-cut criteria as ‘mountain based’ and ‘non-mountain based’, and further as ‘PTSD-affected’ and ‘PTSD-unaffected’. The groups were defined as follows:

*Mountain-based people:* People who live in the plains but visit mountains on occasion, or people who have lived in mountains for less than two years but visit mountains on occasion.

*Non-mountain based people:* People who currently live in mountains since two or more years, or people who have lived in mountains for more than half their lives but currently don’t live there.

*PTSD-affected:* Mountain based respondents whose SQD scores indicate PTSD.

*PTSD-unaaffected:* Mountain based respondents whose SQD scores do not indicate PTSD, or who did not witness the disaster.

The groups were defined in a manner that would objectively demarcate the differences in exposure to mountains in terms of time, as well as clearly demarcate the presence of absence of PTSD. The constructs of Engagement with Natural Beauty and PTSD were used in the context of the paper as follows:

*Engagement with Natural Beauty:* Perception of natural beauty in the form of mountains.

*PTSD:* Post-traumatic Stress Disorder as a result of 2013 Uttarakhand floods.

There was no pre-decided age group for sample collection. A major part of mountain based group was selected from Uttarakhand, to study the effect of PTSD from 2013 Uttarakhand floods on their engagement with natural beauty.

### **Measures**

The study included two scales: Engagement with Natural Beauty Scale (Diessner et al, 2008) and Screening Questionnaire for Disaster Mental Health which was developed after the Kobe 1995 earthquake in Japan (Fujii et al, 2007).

***Engagement With Natural Beauty Scale (ENB):*** The Engagement with Natural Beauty scale (Diessner et al., 2008) was administered to all participants in the sample. It has 4 items and measures an individual's self-reported tendency to perceive natural beauty (such as "I notice beauty in one or more aspects of nature", "When perceiving beauty in nature I feel changes in my body, such as a lump in my throat, an expansion in my chest, faster heart beat, or other bodily responses") on a 7-point scale (1: strongly disagree; 7:strongly agree). The predictive, convergent, and discriminant validity of this measure has been demonstrated before ( $\alpha$ : 0.80, test-retest: 0.84; Diessner et al., 2008). Higher score means a person is more engaged with natural beauty.

***Screening Questionnaire for Disaster Mental Health (SQD):*** SQD was developed as an interview-format rather than a self-reporting scale with a small number of questions. It is easy to use even for those individuals such as the elderly who have difficulty completing self-reporting scales. It consists of 12 yes/no questions, including 9 items on PTSD (SQD-P) and 3 on Depression (SQD-D). It has the advantage that non-experts in mental health, such as public health nurses and clinical nurses, can use this measure after a brief training, and thus is easily incorporated into any local level post-disaster health services. Cronbach's alpha coefficient for reliability of each scale was as follows: SQD: 0.83, SQD-P: 0.77, and SQD-D: 0.74, all exceeding 0.7. Convergent validity of SQD-P was 0.91 and of SQD-D was 0.94 (Fujii et al, 2007). This scale was administered only to the mountain based sample.



### ***Procedure***

Two types of questionnaires were designed: one with both ENB and SQD, and one with only ENB. The first type was administered to the group referred to as “mountain based people” and the second was administered to the group referred to as “non-mountain based people”.

The questionnaires were administered to the mountain based group through in-person interviews, and additional introspective data was also collected. To the non-mountain based people, the questionnaire was administered through a web survey created on a secure server (<https://docs.google.com/forms/d/e/1FAIpQLSfAWxa3q5tELOIBRmjEcbUsLndNkWxqQoOjIDku8mJYO6ZcKA/viewform>), with a section for introspective report. The responses saved themselves in an online sheet acceptable only to the researcher.

Data for the study was collected in the time period of June 2016 to December 2016. Scores for ENB and SQD were calculated from the data received. These scores were divided into various groups and t-test was done on the means to test for significant differences.

### CHAPTER 3: RESULTS

Mean and Standard Deviation (SD) of scores of different groups were calculated. *t-tests* were performed on the means to test for significant differences.

**Table 1: Means and SDs (in brackets) of ENB scores of mountain based and non-mountain based people**

Engagement with Natural Beauty score (Mean)	Sample size (n)	Group
22.34 (3.35)	41	Mountain based
24.25 (2.49)	44	Non-mountain based

**Table 2: Means and SDs (in brackets) of ENB scores of PTSD-affected and PTSD-unaffected mountain based people**

Engagement with Natural Beauty score (Mean)	Sample size (n)	Group
21.18 (3.16)	22	PTSD-affected
23.69 (3.04)	19	PTSD-unaffected

**Table 3: t-test on ENB scores of mountain based and non-mountain based people**

p (one-tailed)	df	t calculated	t critical	Mean <sub>a</sub> - Mean <sub>b</sub>
0.002	83	2.96	2.63 (at 0.005)	1.90

According to Table 3, the p-value is 0.002 which is much less than 0.05 and hence, the difference between the means (i.e, 1.90) is extremely significant. The critical value of student's t at significance level 0.005 is 2.63. The t calculated is 2.96, which is greater than t critical.

Hence, the null hypothesis is rejected, and **hypothesis 1** that “Mountain based people have a lower engagement with natural beauty than non-mountain based people” is proved, with a 0.5% chance of Type II error.

**Table 4: t-test on ENB scores of PTSD-affected and PTSD-unaffected mountain based people**

p (one-tailed)	df	t calculated	t critical	Mean <sub>a</sub> - Mean <sub>b</sub>
0.008	39	2.51	2.365 (at 0.01)	2.50

According to Table 4, the p-value is 0.008 which is much less than 0.05 and hence, the difference between the means (i.e, 2.50) is extremely significant. The critical value of student's t at significance level 0.01 is 2.365. The t calculated is 2.51, which is greater than t critical.

Hence, the null hypothesis is rejected, and **hypothesis 2 that “Experiencing PTSD from floods lowers engagement with natural beauty in mountain based people”** is proved, with 1% chance of Type II error.

## **CHAPTER 4: DISCUSSION**

The study was aimed at comparing the engagement with natural beauty in a mountain-based and a non-mountain based population. Additionally, it also analysed the effect of flood-incited Post Traumatic Stress Disorder on the engagement with natural beauty of a mountain-based population.

The engagement with natural beauty scale refers to the emotional and physiological arousals in response to the perception of beauty in the natural world (Diessner et al., 2008). For instance, the core items of the scale examine whether people felt bodily changes (e.g., lump in my throat), emotions associated with nature (e.g., awe, wonder etc) and common humanity (e.g., love of the entire world) when they perceive natural beauty. The Screening Questionnaire for Disaster Mental Health helps to record both signs of PTSD and the likely occurrence of Depression post a disaster.

The Engagement with Natural Beauty scale and Screening Questionnaire for Disaster Mental Health were administered to a selective mountain based population, and to survivors of the 2013 Uttarakhand floods belonging to the maximum affected regions. It was found that 22 out of 26 survivors had PTSD from the floods.

In their introspective reports, the victims mentioned certain accounts of their symptoms such as “panic attack from a thunderstorm”, “inability to stay at all floors above first floor in buildings”, “phobia of any kind of vicinity to the river including water sports”, and a “constant state of fear of re-occurrence of the floods”.

In the introspective report of other PTSD-unaffected mountain based people were statements such as “I feel great love and a sense of attachment , towards every tree, rock, stream”, “I strongly feel about environment preservation and I plan of dedicating a good amount of nurturing and preserving environment of the mountains because they are my cultural roots as well”, “All these beautiful hills and mountains surrounds you but the beauty is that it never makes me feel small, it makes me feel powerful, convinces you that everything is possible. My love for mountains contradicts my fear of heights”.

The Engagement with Natural Beauty scale was administered to the non-mountain based people. In their introspective reports, the participants mentioned several physiological and emotional responses they have to natural beauty, such as “Smallness. Infinite. An immense appreciation of all forms of natural and human diversity. A strong wish for estrangement from the material world”, “I’m not a very religious person but being in the mountains unites me with the Higher Force responsible for such creations”, “I feel that this purity and innocence needs to be preserved and maintained. It is a moral obligation of all humans to let nature flourish”.

A distinction drawn in introspective reports of PTSD-unaffected mountain based people and non-mountain based people shows that they differ in intensity and kind of attachment. While

the former category perceives their regard for the beauty as a responsibility for environmental preservation, the latter relates it only to the emotional evoking that happens to them when they visit. This goes on to show that engagement with natural beauty in PTSD-unaffected mountain based population reflects a sense of ecological consciousness with regard to their landscape. When compared to their PTSD-affected mountain-based counterpart, the attachment lowers in intensity as well as the physical and emotional arousal experienced as a result of exposure to the natural beauty.

The findings of this study reveal that people who have had an exposure to mountains for more than two years tend to have a lower emotional and physiological arousal in response to the perception of the beauty, than people who have been resident in mountains for less than two years but visited on occasion. The findings also reveal that PTSD due to floods in mountains tends to decrease this emotional and physiological arousal in response to perception of beauty even further.

An assertion this paper goes forward to make is that people migrating from mountains post a natural disaster and its economic repercussions, are doing so because of a certain level of disengagement from the natural landscape of their region, which occurs as a result of the trauma faced in the wake of loss and damage incurred from the floods. This is corroborated also by the distinction in introspective reports of PTSD-affected and PTSD-unaffected mountain based people. While the former was abundant with description of how objects in nature provoke fear post the floods, the latter was a stark contrast in its idea of preservation of the mountains because of a spiritual attachment to them.

The rationale behind first studying the differences in engagement with natural beauty in non-mountain resident and mountain resident population was to show that the mountain resident population has an already low engagement with natural beauty, i.e., the physical and emotional arousal due to natural beauty, and it is a sense of ecological consciousness and environmental preservation that insists them to stay amidst the natural beauty. Thus, when this finding is paired with the finding that PTSD lowers the engagement with natural beauty in a mountain resident population, it also holds that this engagement with natural beauty is already comparatively lower to begin with. Thus, it is vulnerable to the effect of loss incurred by a disaster in that natural beauty, and the sense of ecological preservation will no longer be applicable when the natural disaster destroys the ecology that was being preserved. Therefore, in the event of a natural disaster, engagement with natural beauty and the sense of ecological preservation both lower significantly due to PTSD, and leaves the mountain resident population extremely vulnerable to migrate.

It must also be noted that the data was collected from the survivors of floods who were still resident in the region. This opens a gate for consideration of the fact that the ones who migrated may have had even greater phobias than the sample, and may have had even lower engagement with natural beauty. Thus, the study explores the relationship between PTSD due to a natural disaster and the engagement with natural beauty in a resident population, and

extrapolates from the results that a lower engagement with natural beauty post trauma from a natural disaster may lead to migration from the affected region.

The limitations of the study include its small sample size and level of English education in the flood victims which may have lowered interpretation of the questionnaire. They were provided assistance by the researcher to understand the questions in interview-format, but the same leaves room for some meaning to be lost in translation. Another important limitation was the administration of the test 3 years after occurrence of the natural disaster, and no demarcation on the basis of age group in the sample. This, however, finds some support in research literature through studies which were conducted after a similarly long time window. A study (Hu et al., 2015) in China found that PTSD can persist 13 years after a flood, demographic characteristics (e.g., age, gender, and education level) seem to have no influence on the recovery from PTSD, and trauma-related stressors and social participation are important predictors for remission.

Other limitations could be the ambiguity in definition of mountain based as residence for two or more years, its limited application to mountain based populations and exclusive of other types of natural beauty, and its limited application to floods as a natural disaster. It may also be possible that the two hypotheses are interlinked in some way, and presence of PTSD-affected group lowers the engagement with natural beauty in the mountain-based population to more than a normal sample's ENB score. (However, the mean ENB score of PTSD-affected mountain based population is still significantly low compared to non-mountain based population)

Regardless of the limitations, the study raises correlations which are yet to be tested by the available research literature. The study also tries to bring attention back to the Uttarakhand floods which received very little attention from psychologists in comparison to economists and geologists. Research is abundant with figurative studies on the calamity but none studying the effect of the floods on the mental health of the Uttarakhand population. The link between PTSD and Engagement with Natural Beauty, in addition to low engagement with natural beauty as a predictor of migration in mountain based population are relations that deserve attention. Hence, the study holds implications for policymakers for development of more holistic disaster rehabilitation and anti-migration programmes. The onus which has been on preventing migration through development overlooks the role attachment to one's landscape plays in prevention of migration. Thus, it is essential to focus immediate attention on emancipation from PTSD in the flood victims so as to avoid long-term manifestations of the trauma in migration and other unpredictable resident activities.

## **CHAPTER 5: CONCLUSION**

The study found that people who have had an exposure to mountains for more than two years tend to have a lower engagement with natural beauty than people who have been resident in mountains for less than two years but visited on occasion. The findings also reveal that PTSD due to 2013 Uttarakhand floods tended to decrease this engagement of natural beauty even further in the survivors. These findings hold implications for studying migration patterns in post-disaster mountainous regions, with low engagement with natural beauty as a factor leading to migration, as well as the necessity of including mental health in disaster rehabilitation programmes in order to make them more holistic.

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## CHAPTER 7: APPENDIX

### Screening Questionnaire for Disaster Mental Health

“People who have experienced floods often report that their lives have changed dramatically and they are constantly under various kinds of stress. Have you experienced any of the symptoms?”

- Q1. Have you noticed any changes in your appetite? \_\_\_\_\_ 1. Yes 0. No  
Q2. Do you feel that you are easily tired and/or tired all the time? \_\_\_\_\_ 1. Yes 0. No  
Q3. Do you have trouble falling asleep or sleeping through the night? \_\_\_\_\_ 1. Yes 0. No  
Q4. Do you have nightmares about the event? \_\_\_\_\_ 1. Yes 0. No  
Q5. Do you feel depressed? \_\_\_\_\_ 1. Yes 0. No  
Q6. Do you feel irritable? \_\_\_\_\_ 1. Yes 0. No  
Q7. Do you feel that you are hypersensitive to small noises or tremors? \_\_\_\_\_ 1. Yes 0. No  
Q8. Do you avoid places, people, topics related to the event? \_\_\_\_\_ 1. Yes 0. No  
Q9. Do you think about the event when you do not want to? \_\_\_\_\_ 1. Yes 0. No  
Q10. Do you have trouble enjoying things you used to enjoy? \_\_\_\_\_ 1. Yes 0. No  
Q11. Do you get upset when something reminds you of the event? \_\_\_\_\_ 1. Yes 0. No  
Q12. Do you notice that you are making an effort to try not to think about the event, or are trying to forget it? \_\_\_\_\_ 1. Yes 0. No

### Engagement with Natural Beauty scale

In regard to all responses below: Keep in mind that we are only asking about your experience with perceiving and feeling something as beautiful. We are not asking if you like something; we are not asking if you think something is important; we only ask if you feel it as beautiful. Mark each statement below with a number between 1 and 7: 1 = very unlike me; 2 = unlike me; 3=a little unlike me; 4 = neutral; 5 = a little like me; 6 = like me; 7 = very much like me. Statements 1-4 below refer to experiences with nature and the physical world, including, mountains, rocks rivers, lakes, oceans, deserts, plants, flowers, trees, animals, etc. (but NOT the human body).

- \_\_\_\_1. I notice beauty in one or more aspects of nature.  
\_\_\_\_2. When perceiving beauty in nature I feel changes in my body, such as a lump in my throat, an expansion in my chest, faster heart beat, or other bodily responses.  
\_\_\_\_3. When perceiving beauty in nature I feel emotional, it “moves me,” such as feeling a sense of awe, or wonder or excitement or admiration or upliftment.  
\_\_\_\_4. When perceiving beauty in nature I feel something like a spiritual experience, perhaps a sense of oneness, or being united with the universe, or a love of the entire world.





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